IN THE CLAIMS:

Listing of Claims

This listing of claims replaces all prior versions, and listings, of claims in the application. Currently amended claims are shown with additions underlined and deletions in ~~strikethrough text~~. Please cancel claims 1, 3, 5-12, 17-19, 39, 41-44 and 48 without prejudice to or disclaimer of the subject matter therein. No new matter is added by this amendment.

1.-20. (Canceled)

21. (Currently amended) ~~The method of claim 19, further~~A method, comprising:

creating a dataset that includes a plurality of images associated with a cyclical movement of a body part, at least one image from the plurality of images depicting a non-tissue internal reference marker, being associated with non-tissue internal reference marker positional information, and being at least 2-dimensional;

associating a separate transformation from a tracking space to an image space with each image in the dataset;

calculating for each image in the dataset a dataset vector using a position of an external reference marker and a position of the non-tissue internal reference marker;

outputting data values associated with a display of an image from the plurality of images;

receiving image space coordinates of the non-tissue internal reference marker in the image associated with the dataset vector;

calculating a transformation from the separate transformations using the image space coordinates and the tracking space coordinates;

associating the transformation with the image associated with the dataset vector;

receiving data associated with a current position of the external reference marker;

receiving data associated with a current position of the non-tissue internal reference marker;

calculating a current vector using the data associated with the current position of the external reference marker and the data associated with the current position of the non-tissue internal reference marker;

identifying a match dataset vector (MDV), the MDV being the dataset vector most similar to the current vector, the MDV being associated with an image from the dataset;

receiving a current position of an instrument reference marker coupled to an instrument;

applying the transformation associated with the image associated with the MDV to the current position of the instrument reference marker, thus transforming the current position of the instrument reference marker into image space; and

superimposing a representation of the instrument on the image associated with the MDV.

22. (Currently amended) ~~The method of claim 1, further~~A method, comprising:

creating a dataset that includes a plurality of images associated with a cyclical movement of a body part, at least one image from the plurality of images depicting a non-tissue internal reference marker, being associated with non-tissue internal reference marker positional information, and being at least 2-dimensional;

associating a separate transformation from a tracking space to an image space with each image in the dataset;

calculating for each image in the dataset a dataset vector using a position of an external reference marker and a position of the non-tissue internal reference marker;

outputting data values associated with a display of an image from the plurality of images;

receiving data associated with a current position of the external reference marker;

receiving data associated with a current position of the non-tissue internal reference marker;

calculating a current vector using the data associated with the current position of the external reference marker and the data associated with the current position of the non-tissue internal reference marker;

identifying a match dataset vector (MDV), the MDV being the dataset vector most similar to the current vector, the MDV being associated with an image from the dataset;

receiving a current position of an instrument reference marker coupled to an instrument;

applying the transformation associated with the image associated with the MDV to the current position of the instrument reference marker, thus transforming the current position of the instrument reference marker into image space; and

superimposing a representation of the instrument on the image associated with the MDV, before outputting data values associated with the display.

23. (Canceled)

24. (Previously presented) A method comprising:

receiving a position of an instrument reference marker coupled to an instrument;

transforming the position into image space using data associated with a position of a non-tissue internal reference marker implanted in a patient; and

superimposing a representation of the instrument on an image in which the non-tissue internal reference marker appears, the image being selected based on a look-up table having data associated with a plurality of images.

25. (Previously presented) The method of claim 24, wherein the image was taken using fluoroscopy.

26. (Previously presented) The method of claim 24, wherein the image was taken using computed tomography (CT).

27. (Previously presented) The method of claim 24, wherein the image was taken using magnetic resonance imaging (MRI).

28. (Canceled)

29. (Previously presented) The method of claim 24, wherein the transforming the position includes:

calculating a transformation using image space coordinates and the tracking space coordinates of the internal reference marker in the image.

30. (Previously presented) The method of claim 29, further comprising:

associating the transformation with the image.

31. (Previously presented) The method of claim 30, further comprising:

loading the transformation into a memory.

32. (Previously presented) The method of claim 24, further comprising:

before the superimposing, receiving an image signal that includes the image.

33. (Previously presented) The method of claim 32, further comprising:

receiving data associated with a position of the non-tissue internal reference marker in the image.

34. (Previously presented) The method of claim 33, further comprising:

calculating a vector using the position of the non-tissue internal reference marker and an external reference marker.

35. (Previously presented) The method of claim 34, further comprising:

associating the vector with the image.

36.-44. (Canceled)

45. (Currently amended) ~~The processor readable medium of claim 41, further comprising code to:~~A processor-readable medium storing code representing instructions to cause a processor to perform a process, the code comprising code to:

create a dataset that includes a plurality of images associated with a cyclical movement of a body part, at least one image from the plurality of images depicting a non-tissue internal reference marker, being associated with non-tissue internal reference marker positional information, and being at least 2-dimensional;

associate a separate transformation from a tracking space to an image space with each image in the dataset;

calculate for each image in the dataset a dataset vector using a position of an external reference marker and a position of the non-tissue internal reference marker;

output data values associated with a display of an image from the plurality of images;

receive data associated with a current position of the external reference marker;

receive data associated with a current position of the non-tissue internal reference marker;

calculate a current vector using the data associated with the current position of the external reference marker and the data associated with the current position of the non-tissue internal reference marker;

identify a match dataset vector (MDV), the MDV being the dataset vector most similar to the current vector, the MDV being associated with an image from the dataset;

receive a current position of an instrument reference marker coupled to an instrument;

apply the transformation associated with the image associated with the MDV to the current position of the instrument reference marker, thus transforming the current position of the instrument reference marker into image space; and

superimposing a representation of the instrument on the image associated with the MDV.

46. (Currently amended) ~~The processor-readable medium of claim 41, further comprising code to:~~A processor-readable medium storing code representing instructions to cause a processor to perform a process, the code comprising code to:

create a dataset that includes a plurality of images associated with a cyclical movement of a body part, at least one image from the plurality of images depicting a non-tissue internal reference marker, being associated with non-tissue internal reference marker positional information, and being at least 2-dimensional;

associate a separate transformation from a tracking space to an image space with each image in the dataset;

calculate for each image in the dataset a dataset vector using a position of an external reference marker and a position of the non-tissue internal reference marker;

output data values associated with a display of an image from the plurality of images;

receive data associated with a current position of the external reference marker;

receive data associated with a current position of the non-tissue internal reference marker;

calculate a current vector using the data associated with the current ~~positions~~position of the external reference marker and the data associated with the current position of the non-tissue internal reference marker;

identify a match dataset vector (MDV), the MDV being the dataset vector most similar to the current vector, the MDV being associated with an image from the dataset;

receive a current position of an instrument reference marker coupled to an instrument;

apply the transformation associated with the image associated with the MDV to the current position of the instrument reference marker, thus transforming the current position of the instrument reference marker into image space; and

superimpose a representation of the instrument on the image associated with the MDV, before outputting data values associated with the display.

47. (Previously presented) A processor-readable medium storing code representing instructions to cause a processor to perform a process, the code comprising code to:

receive data associated with a position of an instrument reference marker coupled to an instrument;

transform the data associated with the position into image space using data associated with a position of a non-tissue internal reference marker implanted in a patient; and

superimposing a representation of the instrument on an image in which the non-tissue internal reference marker appears, the image being selected based on a look-up table having data associated with a plurality of images.

48. (Canceled)